AMENDMENTS TO THE CLAIMS

Listing of Claims

1. (Original) A system for identifying abnormal operation of a packaging machine, the system comprising: a sampling entity arranged to sample a signal issued, when in use, to a servo-motor, the signal corresponding to torque values of the servo-motor; a spectrum analyzer for generating a spectral analysis of the sampled signal; a processing unit coupled to a storage device for storing a characterization of a mechanical element coupled to the servo-motor and corresponding to a state of operation, the characterization corresponding to at least one predetermined value for each of at least one frequency of the signal; wherein the processing unit is arranged to determine, when in use, abnormal operation of the mechanical element using the spectral analysis of the sampled signal and the characterization of the mechanical element.

2. (Original) A system as claimed in claim 1, wherein the state of operation is normal operation.

3. (Original) A system as claimed in claim 1, wherein the processing unit is arranged to determine an actual sampling period of the sampling unit.

4. (Original) A system as claimed in claim 3, wherein the actual sampling period is derived from an expected sampling period, an expected speed and an actual position of the servomotor.

5. (Original) A system as claimed in claim 4, wherein a correction factor is calculated from the actual sampling period and the expected sampling period for applying to the sampled signal.

6. (Currently Amended) A system as claimed in claim 1, wherein the ~~characterisation~~ characterization is learnt.

7. (Original) A system as claimed in claim 1, wherein fuzzy logic is used to quantify the abnormal operation of the mechanical element.

8. (Original) A system as claimed in claim 7, wherein the at least one predetermined value for the each of the at least one frequency of the signal is embodied in at least one respective rule applicable, when in use, to the spectral analysis signal.

9. (Withdrawn) A diagnostic apparatus for identifying abnormal operation of a packaging machine, the apparatus comprising: a processing unit arranged to receive a sampled signal issued, when in use, to a servo-motor, the signal corresponding to torque values of the servo-motor; wherein the processing unit is coupled to a storage device for

storing a characterization of a mechanical element coupled to the servo-motor, the characterization comprising at least one predetermined value corresponding to a plurality of the torque values of the servo-motor in a condition of normal operation; and the processing unit is arranged to determine, when in use, abnormal operation of the mechanical element using the sampled signal and the characterization of the mechanical element.

10. (Original) A method of identifying abnormal operation of a packaging machine, the method comprising the steps of: sampling a signal issued to a servomotor, the signal corresponding to torque values of the servo-motor; retrieving a previously stored characterization of a mechanical element coupled to the servo-motor, the characterization comprising at least one predetermined value corresponding to a plurality of the torque values of the servo-motor in a condition of normal operation; and determining abnormal operation of the mechanical element using the sampled signal and the characterization of the mechanical element.

11. (Original) A computer program element comprising: computer program means to make a computer execute the method of claim 10.

12. (Original) A computer program element as claimed in claim 11, embodied on a computer readable medium.

13. (Withdrawn) A system for monitoring the condition of a packaging machine during operation and diagnosing potential problems in the performance of the machine, the system comprising: an input device, an output device, and a processing unit that supports a user interface, the processing unit being arranged to permit a user, when in use, to input via the input device a number of predetermined parameters to measure one or more elements or assemblies in the machine, to receive information from one or more sensors measuring the element or assembly and to compare the information with the parameter to render via the output device an output signal.

14. (Withdrawn) A system as claimed in claim 13, wherein the output signal is a warning message displayed on the output device.

15. (Withdrawn) A system as claimed in claim 13, wherein the output signal actuates an auto-correction device.

16. (Withdrawn) A system as claimed in claim 13, wherein the output signal is a message warning the operator about scheduled maintenance.

17. (Withdrawn) A programmed computer for generating control data for controlling a packaging machine, comprising memory having at least one region for storing computer executable program code, and a processor for executing the program code stored in the memory, wherein the program code includes: code to receive input data

corresponding to a number of measurements made respectively based upon measurements recorded by one or more sensors monitoring an element or assembly of the machine; code to generate a comparison between the input data and stored data corresponding to pre-determined parameters for the element or assembly; code to generate output data for the packaging machine when the input data does not correspond to the stored data.

18. (Withdrawn) A computer readable medium having computer executable software code stored thereon, the code being for the monitoring of a packaging machine and comprising: code to receive input data corresponding to a number of measurements made respectively based upon measurements recorded by one or more sensors monitoring an element or assembly of the machine; code to generate a comparison between the input data and stored data corresponding to pre-determined parameters for the element or assembly; code to generate output data for the packaging machine when the input data does not correspond to the stored data.